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ABSTRACT

Reward contingencies and other extrinsic constraints on behavior can lead to reduced levels of interest in and/or decreased engagement in a target activity in a subsequent noncontingent situation. It has been hypothesized that this effect is caused by a change in the self-perceived locus of activation from intrinsic to extrinsic. It follows from this that effective rewards are more likely to produce the overjustification effect than are ineffective rewards. However, a review of empirical studies suggests the opposite conclusion. This experiment manipulates four levels of the behavior constraint-reinforcement variable: attractive reward, unattractive reward, request to perform, and a no-reward, no-request control. Only the unattractive reward and request groups indicated performance decrements which suggest the overjustification effect. The attractive reward group was significantly different from these two groups on this measure. Results indicate that reinforcement does not cause the overjustification effect. The behavior constraining aspect of a contingency seems to produce the effect, while the reinforcement, or reward value, aspect leads to an increase in interest and post-contingency performance. (Author)

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Reinforcement and the Overjustification Effect

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Reinforcement and the Overjustification Effect

Since 1971 more than twenty-five studies have attempted to investigate the effects of extrinsic reward on intrinsic motivation. The well-replicated but not universal finding that rewards lead to decreases in intrinsic motivation is called the overjustification effect. In many studies of the overjustification effect, a standard experimental paradigm is used. There is a baseline period, in which the degree of initial interest in the target behavior is assessed; a contingency (or manipulation) period, in which the target behavior is rewarded; and a post-contingency free choice period, in which the amount of interest in the target behavior is again assessed and is predicted to be less than the initial degree of interest.

I will use the term "overjustification effect" to refer to the below-baseline decrease in rate of performance of initially "intrinsically motivated" behavior following a period during which the behavior is extrinsically rewarded. The term "overjustification effect" as used in this paper refers only to the behavioral phenomenon, not to the "overjustification hypothesis" interpretation of that phenomenon.

The overjustification hypothesis is based on Bem's (1967) self-perception theory and on DeCharms's (1968) theory of personal causation. This cognitive hypothesis is succinctly stated by Greene, Sternberg, and Lepper (1976):

> A person's intrinsic interest in an activity may be decreased by inducing him to engage in that activity as an explicit means to some extrinsic goal. (p. 1219)

The person, who already performs the behavior because of no more motivation than that which accrues from intrinsic interest in the activity, is then seen as having more than sufficient motivational justification to perform the activity. This oversufficient justification results in the perception that his level of intrinsic motivation to perform the activity is less than it was initially. The reduced level of intrinsic interest in the activity then causes the person to perform the activity less when the reward contingency is removed than he did initially.

Overjustification and Reward

From a practical standpoint, the most important conclusion drawn from the experiments on the overjustification effect is that extrinsic rewards may have long-term deleterious effects on attitudes toward and performance of the rewarded activity. Lepper and his colleagues (e.g., Lepper and Greene, 1976; Lepper, Greene, and Nisbett, 1973; Greene, Sternberg, and Lepper, 1976) conclude that salient tangible rewards undermine intrinsic motivation. Similarly, Deci (1971, 1972a, 1972b, 1975) has concluded that contingent pay causes a decrease in intrinsic motivation and has accordingly cautioned educators and managers against the use of extrinsic rewards (Deci, 1976). Notz (1975) cautions those who design and implement work systems against the use of extrinsic rewards, and partly on the basis of the overjustification data Levine and Fasnacht (1974) argue against the use of token economies. One purpose of the present study is to determine whether these conclusions and admonitions concerning the causal role of rewards in producing the overjustification effect are justified.

It is far from clear that reward per se is the critical causal agent which produces the overjustification effect. On the one hand, the effect has been produced by non-reward manipulations. Extrinsic constraints on performance such as surveillance (Lepper and Greene, 1975), deadlines (Amabile, De Jong, and Lepper, 1976), and coercion (Swann and Pittman, 1977) have produced the overjustification effect in the absence of external rewards. On the other hand, a number of studies which did use reward manipulations have failed to obtain an overjustification effect (e.g. Feingold and Mahoney, 1975; Reiss and Susninsky, 1975, Experiment 2; Davidson and Bucher, 1978).

According to the overjustification hypothesis, rewards lower intrinsic interest only when they are perceived as controlling behavior and when they are perceived as a sufficient reason for engaging in the rewarded behavior. Accordingly, the overjustification effect should be most likely to be obtained when a reward produces a reinforcement effect--that is, when the rewarded activity is significantly increased when the contingency is in effect, relative to the no-reward baseline. This is because the perception of the reward as "controlling" should be more readily made than if the reward did not significantly affect the behavior. It is therefore inconsistent with the overjustification hypothesis that in those experiments where a reinforcement effect was obtained, the overjustification effect was not found.

Lepper and Greene (1976) note that several studies which have found the overjustification effect have not used rewards which

produced reinforcement effects. However, they stop short of suggesting the possibility that the overjustification effect can be obtained only when a reinforcement effect is not obtained. They maintain that the relationship between reinforcement and subsequent decreased interest is not of great theoretical interest. Instead, they are concerned with the cognitive processes presumed to mediate the overjustification effect. However, it is likely that such cognitive processes (e.g., perception of reward as controlling behavior) would be affected by the behavior change which defines a reinforcement effect.

A Two-Factor Model of the Reward Procedure

Another way of looking at the role of rewards in producing the overjustification effect is to consider that the reward procedure may have distinct and possibly separable components, some of which may be instrumental in producing the effect and some of which may not be. Reward contingencies may differ with respect to the subjective value of the reward; I will call this aspect of the contingency "reward value." Contingencies may also differ with respect to aspects of the communication which conveys information to the subject concerning what is required of him in order to obtain the reward. This latter aspect of the contingency might be labeled the "behavior constraint" component of reward.

Bearing in mind the evidence that rewards sometimes do not lead to the overjustification effect (e.g., Feingold and Mahoney, 1975; Davidson and Bucher, 1978) and the evidence that non-reward constraints on behavior may cause the effect (Amabile et al., 1976; Lepper and

Greene, 1975; Swann and Pittman, 1977), it is hypothesized that the behavior constraint component of reward is the critical feature of those reward procedures which do result in the overjustification effect. The more salient is the perception that one's behavior is being controlled, the greater the overjustification effect.

There is no evidence that an increase in reward value will increase the magnitude of the overjustification effect. In fact, in the only experiments which did report a reinforcement effect, the overjustification effect was not found. This suggests that the effectiveness of rewards may be a critical factor in producing an overjustification effect by means of a reward contingency. Therefore, it is further hypothesized that the greater the reward value, the less the overjustification effect.

The Present Experiment

The present experiment was designed to test the notion that reward value is inversely related to the overjustification effect, which, it should be noted, is the opposite relationship hypothesized by the overjustification hypothesis. It was planned that in one reward condition, a reinforcement effect would occur, and that in a second reward condition, the contingent reward would be less highly valued so that it would not result in a reinforcement effect. If these differential effects on behavior were obtained during the contingency period, it would then be possible to determine the effects of reinforcement on performance during the subsequent free choice period. Two sets of rewards were selected on the basis of preference measures obtained in

a preliminary study designed to assess the reward value of a number of potential rewards. On the basis of the results of this preliminary study, four comic books were selected as high-valued rewards for girls in the main study, and four comics were chosen as high-valued rewards for boys. Four low-valued comics were selected as unattractive rewards for both girls and boys.

Method

Subjects

Thirty-two male and sixteen female fourth and fifth grade students from four classrooms at Franklin Elementary School in Santa Barbara participated as subjects. The subjects were randomly assigned to four experimental conditions such that eight boys (half fourth graders and half fifth graders) and four girls (half from each grade level) were assigned to each condition.

Setting

The experiment was carried out in a two-room trailer. A one-way mirror permitted observation of each subject while he or she was alone in one room of the trailer.

Procedure

Each subject was tested individually on three separate days. On each subject's first day of testing, the experimenter demonstrated each of four games. The subject rated each game on a seven-point Likert scale measuring liking for the game, and then he or she ranked the four games from "favorite" to "least favorite." The highest ranked game was noted by the experimenter as the "target" activity,

and the rest of the games were thenceforth used as "distractors."

The experimenter then gave the appearance of leaving the trailer. When he left the activity room, he took from the room either the target activity or the comic books in the room. All the subjects were told that they could play with anything in the room while the experimenter was away. The subject was led to believe that the experimenter was no longer in the trailer, but in fact the experimenter unobtrusively observed the subject for ten minutes through the one-way mirror, recording the number of seconds spent in contact with the distractors and the comics or the target activity. For all subjects, the distractors remained in the activity room for the duration of the experiment.

After giving the subject a short math test, the experimenter again gave the appearance of leaving and observed the subject for ten minutes. The subjects who had comics in the room for the initial observation period now had the target activity, and vice-versa. The entire session lasted about forty-five minutes.

On the second day of testing, the three-phase overjustification paradigm was followed. The subject was initially observed for a ten-minute baseline period with the target activity and the three distractors. The second ten-minute observation period was the manipulation period, which was the only time when subjects in different conditions received different treatments. Request group subjects were asked to play with the target activity while the experimenter was away. Subjects in the two reward groups were additionally offered two comic books as an incentive for playing with the target activity. Subjects in

the attractive reward group were offered attractive comic books, and subjects in the unattractive reward group were offered unattractive comics. Control group subjects received neither a request to perform nor an offer of reward. After this observation period, the experimenter told the reward condition subjects that there was a limited number of comics and that they would receive no more comics for playing with any of the games. The experimenter again gave the appearance of leaving the trailer and observed the subjects during a ten-minute free-choice period. The experimenter returned and asked several questions about the activities before dismissing the subject. The entire session lasted about fifty minutes.

The procedure on Day 3 paralleled that on Day 1. There were two observation periods to assess interest in the target activity and the comic books used as rewards. At the end of the session, the experimenter asked several questions, including re-rating and re-ranking of the games and comics. Each subject was then debriefed. The session lasted about forty-five minutes. Questioning of subjects and classroom observations by teachers strongly suggested that secrecy was effectively maintained.

Results

Reward Preference Measures

The comic books which were judged as "attractive" on the basis of the preliminary study were rated by experimental subjects on Day 1 as better liked than the "unattractive" comics, $p < .001$. The time spent during Day 1 on the two sets of comics also supported the valid-

ity of the comic book classification. The mean time spent on the attractive comics was 208.3 seconds, and on the unattractive comics, 78.2 seconds, $p<.05$. Thus, the comic books used as "attractive" rewards were liked significantly more by experimental subjects than the comics used as "unattractive" rewards.

Target Activity Behavioral Measures

The primary measure of interest in the target activity was number of seconds spent on the target during the observation periods. The four experimental groups did not spend differential amounts of time on the target activity in the baseline period, $F<1$. An analysis of covariance was performed on the time spent during the manipulation period, and the four experimental groups were found to be significantly different, $p<.003$. This and other analyses indicate that the reward and request manipulations had their intended effects during the manipulation period. The high-valued reward produced a significant reinforcement effect, and the low-valued reward and the request manipulation produced nearly identical non-significant performance increments.

An analysis of covariance was also performed on time spent during the free choice period, again using baseline measures as covariates. Again, the groups were found to be significantly different, $p<.04$. Other analyses suggest an overjustification effect for the unattractive reward and request groups, but clearly there was no overjustification effect for the attractive reward group since the time spent on the target in the free choice period was greater than the time spent in the baseline period.

The four experimental groups were virtually identical on the amount of time spent on the target activity on Day 3, $F<1$. Thus, the differences obtained on Day 2 were not maintained in the Day 3 follow-up observations.

Target Activity Ratings

The changes in rated liking for the target activity parallel the changes in amount of time spent, but these differences did not reach statistical significance.

Discussion

The hypothesized inverse relationship between a reinforcement effect and an overjustification effect were confirmed. The overall findings of this study suggest that reward per se does not cause the overjustification effect. The results suggest that attractive rewards, or effective reinforcers, have a post-contingency effect of increasing the rewarded behavior, which is the opposite prediction of the overjustification hypothesis.

These results are consistent with the two-component model of the human reward procedure which was proposed earlier. It may be concluded on the basis of differential results from the four groups in the free choice period that the behavior constraint component leads to the overjustification effect but that the addition of a high level of the reward value component counteracts the effect. As noted earlier, this two-process formulation is compatible with the research literature on the overjustification effect.

Implications for Behavioral Management Systems

The hypothesis that extrinsic reward causes decreases in post-contingency performance has led to conclusions and admonitions concerning the use of rewards in schools (Deci, 1976; Greene, Sternberg, and Lepper, 1976), work environments (Notz, 1975; Deci, 1976), and behavior therapy (Levine and Fasnacht, 1974; Lepper and Greene, 1976). The conclusions drawn from the present study clearly contradict this hypothesis and suggest that the admonitions against the use of rewards are not justified.

In the present experiment, effective rewards did not lead to subsequent performance decrements, but there was some evidence of short-term performance decreases after ineffective rewards were used. Similarly, in a survey of other experiments on the overjustification effect, it was found that the effect was obtained only when rewards were used which were not demonstrated to effectively control behavior during the contingency period. These observations imply that administrators of real-world reward systems should use effective rewards in order to avoid a decrease in intrinsic motivation and decrements in post-contingency performance. It may not always be easy to determine in advance what rewards will be effective, but the present experiment represents one successful attempt to do so. Administrators may adapt the Premack Principle (Premack, 1965) to assess the likely effectiveness of potential rewards, or they may use a system of tokens which may be exchanged for a variety of items on a "reinforcement menu" in hope that at least one of the items on the menu will be highly valued.

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